IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant:	Hong Su et al.	Art Unit:	2162
Serial No.:	10/091,237	Conf. No.:	7188
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For:	Method and System Of Document Transformation Between A Source Extensible Markup Language (Xml) Schema And A Target Xml Schema	Atty Docket:	10013661-1 (HPC.0811US)

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APPEAL BRIEF

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Janice Munoz

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REAL PARTY IN INTEREST

The Hewlett-Packard Development Company, LP, a limited partnership established under the laws of the State of Texas and having a principal place of business at 20555 S.H. 249 Houston, TX 77070, U.S.A. (hereinafter "HPDC"). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware Corporation, headquartered in Palo Alto, CA. The general or managing partner of HPDC is HPQ Holdings, LLC.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

The application was originally filed with claims 1-26. Claims 1, 5, 6, 8, 10, 11, 16, 18, 22 and 25 have been finally rejected and are the subject of this appeal.

STATUS OF AMENDMENTS

All amendments have been entered.

SUMMARY OF CLAIMED SUBJECT MATTER

At this point, no issue has been raised that would suggest that the words in the claims have any meaning other than their ordinary meanings. Nothing in this section should be taken as an indication that any claim term has a meaning other than its ordinary meaning.

The method of independent claim 1 includes modeling a source XML document corresponding to a source schema as a source tree having a plurality of source nodes (Specification, ll. 15-20, p. 7); modeling a target XML document corresponding to a target schema as a target tree having a plurality of target nodes (Specification, ll. 15-20, p. 7); and generating a sequence of transformation operations that transforms the source tree to the target tree. The sequence of transformation operations utilizes an extensible stylesheet language for transformations (XSLT) generator to translate the sequence of transformation operations into an equivalent XSLT transformation script and utilize the transformation script to transform an input XML document corresponding to the source schema to the target XML document corresponding to the target schema (Specification, ll. 7-12, p. 8).

The method of independent claim 10 includes modeling a source schema of XML and a target schema of XML as a tree structure creating a source tree and a target tree, said source tree having a plurality of source nodes, said target tree having a plurality of target nodes (Specification, ll. 15-20, p. 7); and generating a sequence of transformation operations that transforms said source XML document to said target XML document, where the plurality of source nodes of the source schema are matched and transformed to the plurality of target nodes in said target schema. The sequence of transformation operations utilizes an extensible stylesheet language for transformations (XSLT) generator to translate the sequence of transformation operations into an equivalent XSLT transformation script and utilize the transformation script to transform an input XML document corresponding to the source schema to the target XML document corresponding to the target schema (Specification, ll. 7-12, p. 8).

The computer system of independent claim 18 includes a processor (Specification, ll. 9-12, p. 7); and a computer readable memory coupled to said processor and containing program

instructions that, when executed, implement a method of document transformation (Specification, ll. 9-12, p. 7). The method includes modeling a source XML document corresponding to a source schema as a source tree having a plurality of source nodes (Specification, ll. 15-20, p. 7); modeling a target XML document corresponding to a target schema as a target tree having a plurality of target nodes (Specification, ll. 15-20, p. 7); and generating a sequence of transformation operations that transforms the source tree to the target tree. The sequence of transformation operations utilizes an extensible stylesheet language for transformations (XSLT) generator to translate the sequence of transformation operations into an equivalent XSLT transformation script and utilize the transformation script to transform an input XML document corresponding to the source schema to the target XML document corresponding to the target schema (Specification, ll. 7-12, p. 8).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. **Whether Claims 1, 10, 11 and 16 Are Rendered Obvious under 35 U.S.C. § 103(a) As Being Unpatentable over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM) and U.S. Patent Application Publication No. 2004/0216030 (Hellman)?**

1. **Whether Claim 1 Is Rendered Obvious under 35 U.S.C. § 103(a) As Being Unpatentable over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM) and U.S. Patent Application Publication No. 2004/0216030 (Hellman)?**

2. **Whether Claim 10 Is Rendered Obvious under 35 U.S.C. § 103(a) As Being Unpatentable over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM) and U.S. Patent Application Publication No. 2004/0216030 (Hellman)?**

3. **Whether Claim 11 Is Rendered Obvious under 35 U.S.C. § 103(a) As Being Unpatentable over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM) and U.S. Patent Application Publication No. 2004/0216030 (Hellman)?**

4. **Whether Claim 16 Is Rendered Obvious under 35 U.S.C. § 103(a) As Being Unpatentable over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM) and U.S. Patent Application Publication No. 2004/0216030 (Hellman)?**

B. **Whether Claim 18 Is Rendered Obvious under 35 U.S.C. § 103(a) in View of the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM), U.S. Patent Application Publication No. 2004/0216030 (Hellman) and U.S. Patent No. 6,874,141 (Swamy)?**

C. **Whether Claims 5, 6 and 8 Are Rendered Obvious under 35 U.S.C. § 103(a) over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM), U.S. Patent Application Publication No. 2004/0216030 (Hellman) and an Article by Peter Buneman Entitled, "UnQL: A Query Language and Algebra For Semistructured Data Based On Structural Recursion," (Buneman)?**

1. **Whether Claim 5 Is Rendered Obvious under 35 U.S.C. § 103(a) over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM), U.S. Patent Application Publication No. 2004/0216030 (Hellman) and an Article by Peter Buneman Entitled, "UnQL: A Query Language and Algebra For Semistructured Data Based On Structural Recursion," (Buneman)?**

2. **Whether Claim 6 Is Rendered Obvious under 35 U.S.C. § 103(a) over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM), U.S. Patent Application Publication No. 2004/0216030 (Hellman) and an Article by Peter Buneman Entitled, "UnQL: A Query Language and Algebra For Semistructured Data Based On Structural Recursion," (Buneman)?**

3. **Whether Claim 8 Is Rendered Obvious under 35 U.S.C. § 103(a) over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM), U.S. Patent Application Publication No. 2004/0216030 (Hellman) and an Article by Peter Buneman Entitled, "UnQL: A Query Language and Algebra For Semistructured Data Based On Structural Recursion," (Buneman)?**

D. **Whether Claims 22 and 25 Are Rendered Obvious under 35 U.S.C. § 103(a) over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM), U.S. Patent Application Publication No. 2004/0216030 (Hellman), U.S. Patent No. 6,874,141 (Swamy) and the Article by Peter Buneman Entitled, "UnQL: A Query Language and Algebra For Semistructured Data Based On Structural Recursion," (Buneman)?**

1. **Whether Claim 22 Is Rendered Obvious under 35 U.S.C. § 103(a) over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM), U.S. Patent Application Publication No. 2004/0216030 (Hellman), U.S. Patent No. 6,874,141 (Swamy) and the Article by Peter Buneman Entitled, "UnQL: A Query Language and Algebra For Semistructured Data Based On Structural Recursion," (Buneman)?**

2. **Whether Claim 25 Is Rendered Obvious under 35 U.S.C. § 103(a) over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM), U.S. Patent Application Publication No. 2004/0216030 (Hellman), U.S. Patent No. 6,874,141 (Swamy) and the Article by Peter Buneman Entitled, "UnQL: A Query Language and Algebra For Semistructured Data Based On Structural Recursion," (Buneman)?**

ARGUMENT

A. Whether Claims 1, 10, 11 and 16 Are Rendered Obvious under 35 U.S.C. § 103(a) As Being Unpatentable over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM) and U.S. Patent Application Publication No. 2004/0216030 (Hellman)?

1. Whether Claim 1 Is Rendered Obvious under 35 U.S.C. § 103(a) As Being Unpatentable over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM) and U.S. Patent Application Publication No. 2004/0216030 (Hellman)?

The method of independent claim 1 includes modeling a source XML document corresponding to a source schema as a source tree having a plurality of source nodes; modeling a target XML document corresponding to a target schema as a target tree having a plurality of target nodes; and generating a sequence of transformation operations that transforms the source tree to the target tree. The sequence of transformation operations utilizes an extensible stylesheet language for transformations (XSLT) generator to translate the sequence of transformation operations into an equivalent XSLT transformation script and utilize the transformation script to transform an input XML document corresponding to the source schema to the target XML document corresponding to the target schema.

Claim 1 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the article by Hong Su entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (hereinafter called "Schema Matching") in view of the article by Hong Su entitled, "XEM: Managing the Evolution of XML Documents," (hereinafter called "XEM") and U.S. Patent Application Publication No. 2004/0216030 (hereinafter called "Hellman").

To make a determination under 35 U.S.C. § 103, several basic factual inquiries must be performed, including determining the scope and content of the prior art, and ascertaining the differences between the prior art and the claims at issue. *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 U.S.P.Q. 459 (1965). Moreover, as the U.S. Supreme Court held, it is important to identify a reason that would have prompted a person of ordinary skill in the art to combine

reference teachings in the manner that the claimed invention does. *KSR International Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741, 82 U.S.P.Q.2d 1385 (2007).

The Final Office Action relies on Hellman for the disclosure of converting XML expressions into an XLT script for transforming a source data schema into data conforming to a target data schema. Final Office Action, p. 7. In particular, the Final Office Action relies on paragraph nos. [0065] and [0066] of Hellman. *Id.*

Although the present application has a filing date of March 4, 2002, the present invention was reduced to practice prior to November 5, 2001, as set forth in the Declaration Under 37 CFR § 1.131, which was filed on December 12, 2005, in this application. Hellman has an actual filing date of January 15, 2002, and is a continuation-in-part of U.S. Patent Application Serial No. 09/866,101, which has a filing date of May 25, 2001.

Due to the present invention antedating the actual filing date of Hellman, the Final Office Action relies on Hellman's parent application, US Patent Application Publication No. 2003/0163597, or U.S. Patent Application Serial No. 09/866,101 (hereinafter called the "'101 application"), Final Office Action, pp. 5 and 7. The '101 application has a filing date of May 25, 2001.

Applicant respectfully submits, however, that the subject matter that is relied on in the § 103 rejection of independent claim 1, i.e., Hellman's disclosure of the conversion of XML expressions into an XLT script, is not supported by the '101 application. As such, the disclosure in Hellman, which is relied on by the Examiner is not entitled to the filing date of the '101 application.

Hellman qualifies as prior art under 35 U.S.C. § 102(e). Thus, for at least the reason that the effective filing date of the present application antiquates Hellman, Hellman may not be used as a § 103 reference against claim 1.

It is noted that the '101 application is a § 102(e) reference. Therefore, if the '101 application supports Hellman's disclosure of converting XML expressions into XSLT script, a contended by the Examiner, then the '101 application, instead of Hellman, should be used as the § 103 reference against claim 1.

The Final Office Action appears to contend that in lines 23-27 on page 32, the '101 application discloses the conversion of XML expressions into XSLT script. *See, for example,* Final Office Action, p. 2. This page of the '101 application, however, fails to mention the

conversion of a XML expression into XLT script in the '101 application. In fact, in a word search on the '101 application, Applicant cannot find any instance of "XSLT" script. Instead, the conversion of the XML expressions into XSLT script is first introduced in the child application, i.e., Hellman. However, due to the failure of the '101 application to support this disclosure, Hellman does not qualify as a § 103 reference for the purported disclosure of converting XML expressions into an XLT script.

Thus, for at least the foregoing reasons, § 103 rejection of independent claim 1 is in error and should be reversed.

2. Whether Claim 10 Is Rendered Obvious under 35 U.S.C. § 103(a) As Being Unpatentable over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM) and U.S. Patent Application Publication No. 2004/0216030 (Hellman)?

The method of independent claim 10 includes modeling a source schema of XML and a target schema of XML as a tree structure creating a source tree and a target tree. The source tree has a plurality of source nodes, and the target tree has a plurality of target nodes. The method of claim 10 includes generating a sequence of transformation operations that transforms the source XML document to said target XML document, where the plurality of source nodes of the source schema are matched and transformed to the plurality of target nodes in the target schema. The sequence of transformation operations utilizes an extensible stylesheet language for transformations (XSLT) generator to translate the sequence of transformation operations into an equivalent XSLT transformation script and utilize the transformation script to transform an input XML document corresponding to the source schema to the target XML document corresponding to the target schema.

Claim 10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Schema Matching in view of XEM and Hellman. In particular, the Final Office Action relies on Hellman for the purported disclosure of converting of XML expressions into XLT script. Final Office Action, p. 11. However, the effective filing date of the present application has been established to be at least as early as November 5, 2001, a date that precedes the actual filing date of Hellman. Although Hellman claims priority to the '101 application, the '101 application fails to disclose the

conversion of XML expressions into XSLT script, as an XSLT script is not even mentioned in the '101 application. As such, Hellman may not be used as a § 103 reference for this purpose. It is noted that if the '101 application did purportedly disclose converting XML expressions into XLT script, as contended by the Examiner, then the Examiner should have applied the '101 application and not Hellman as a § 103 reference. However, in the current rejection, the Hellman does not qualify as prior art, as the XML expression to XSLT script language was added in the application filed on May 25, 2001, a date that is after the effective filing date of the present application.

Thus, in view of the foregoing, the § 103 rejection of independent claim 10 is in error and should be reversed.

3. Whether Claim 11 Is Rendered Obvious under 35 U.S.C. § 103(a) As Being Unpatentable over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM) and U.S. Patent Application Publication No. 2004/0216030 (Hellman)?

Claim 11 depends from claims 10 and sets forth specific acts for performing the generation of the sequence of transformation operations. Claim 11 recites for each source node in the source tree, selecting a plurality of candidate nodes in the target tree that are possible matches; for each source node in the source tree, generating a plurality of node transformation operations transforming to each of the plurality of candidate nodes; and for each source node in the source tree, selecting one of the plurality of node transformation operations forming a selected node transformation operation having the least cost of data loss.

Claim 11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Schema Matching in view of XEM and Hellman.

Claim 11 overcomes the § 103 rejections for at least the same reasons as claim 10, as discussed above. Claim 11 overcomes the § 103 rejections for at least the additional, independent reasons that are set forth below.

The Final Office Action in particular refers to pages 2 and 7 of Schema Matching for the purported disclosure of the elements of claim 11. Final Office Action, p. 11. However, the cited language fails to disclose selecting a plurality of candidate nodes in a target tree or the generation

of a plurality of node transformation operations transforming to each of the plurality of candidate nodes.

Furthermore, claim 11 recites selecting one of the plurality of node transformations from a selected node transformation operation having the least cost of data loss. The Final Office Action refers to Schema Matching's discussion of a "distance" and attributes this "distance" as a "cost." Final Office Action, p. 11. Even assuming, however, for purposes of argument, that a distance is a cost, Schema Matching fails to disclose that the distance is the least cost of data loss or that the purported "cost" is even a data loss.

Therefore, for at least any of the foregoing reasons, Schema Matching fails to disclose the additional limitations that are set forth in dependent claim 11. Furthermore, the Final Office Action fails to set forth a plausible reason to explain why one of skill in the art in possession of the cited references would have derived the missing claim limitations.

Thus, in view of the foregoing, the § 103 rejection of claim 11 is in error and should be reversed.

4. Whether Claim 16 Is Rendered Obvious under 35 U.S.C. § 103(a) As Being Unpatentable over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM) and U.S. Patent Application Publication No. 2004/0216030 (Hellman)?

The method of claim 16 depends from claim 10 and recites that the method of claim 10 further includes performing transformation operations only once at a node in the source tree and the target tree with the following exceptions: a relabel operation following an unfold operation; the unfold operation following the relabel operation; and the relabel operation performed between an attribute and an element following or followed by a deletion or an addition of a qmark quantifier node.

Claim 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Schema Matching in view of XEM and Hellman.

Claim 16 overcomes the § 103 rejection for at least the reason that this claim depends from an allowable claim for the reasons that are set forth above. Claim 16 is patentable for at least the additional, independent reasons that are set forth below.

In the § 103 rejection of claim 16, the Examiner relies on the purported disclosure in XEM of the labeling of nodes and the notation used. Final Office Action, pp. 13. However, the cited language in XEM, which is relied on by the Examiner fails to disclose performing transformation operations only once at a node with the explicitly-recited exceptions that are set forth in claim 16.

The Final Office Action appears to rely on a *per se* obvious standard, as the Final Office Action states, "when certain functions are performed as merely an obvious variant." Final Office Action, p. 14. There are no, however, *per se* rules of obviousness. *In re Ochiai*, 37 USPQ 2d., 1127, 1133 (Fed. Cir. 1995)

Furthermore, the Final Office Action fails to specifically address the missing claim limitations by setting forth a plausible reason to explain why one of skill in the art in possession of the claim limitations would have derived these limitations.

Thus, in view of the foregoing, the § 103 rejection of claim 16 is in error and should be reversed.

B. Whether Claim 18 Is Rendered Obvious under 35 U.S.C. § 103(a) in View of the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM), U.S. Patent Application Publication No. 2004/0216030 (Hellman) and U.S. Patent No. 6,874,141 (Swamy)?

The computer system of independent claim 18 includes a processor; and a computer readable memory coupled to the processor and contains program instructions that, when executed, implement a method of document transformation. This method includes modeling a source XML document corresponding to a source schema as a source tree having a plurality of source nodes; modeling a target XML document corresponding to a target schema as a target tree having a plurality of target nodes; and generating a sequence of transformation operations that transforms the source tree to the target tree, said sequence of transformation operations utilizing an extensible stylesheet language for transformations (XSLT) generator to translate the sequence of transformation operations into an equivalent XSLT transformation script and utilize the transformation script to transform an input XML document corresponding to the source schema to the target XML document corresponding to the target schema.

Claim 18 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Schema Matching in view of XEM, Hellman and U.S. Patent No. 6,874,141 (hereinafter called "Swamy").

Claim 18 recites generating a sequence of transformation operations that transforms the source tree to the target tree. The sequence of transformation operations utilize an extensible stylesheet language transformations (XSLT) generator to translate the sequence of transformation operations into an equivalent XSLT transformation script.

The Final Office Action relies on Hellman for the purported disclosure of the conversion of XML expressions into an XSLT script. However, as set forth above, the present invention has an effective filing date of at least November 5, 2001, which is before the actual filing date of Hellman. Although Hellman claims priority to the '101 application, Hellman is not entitled to the filing date of the '101 application for the disclosure relied on by the Examiner for at least the reason that the '101 application fails to disclose the use or generation of XSLT script, much less converting XML expressions into XSLT script.

Thus, in view of the foregoing, the § 103 rejection of claim 18 is in error and should be reversed.

C. Whether Claims 5, 6 and 8 Are Rendered Obvious under 35 U.S.C. § 103(a) over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM), U.S. Patent Application Publication No. 2004/0216030 (Hellman) and an Article by Peter Buneman Entitled, "UnQL: A Query Language and Algebra For Semistructured Data Based On Structural Recursion," (Buneman)?

1. Whether Claim 5 Is Rendered Obvious under 35 U.S.C. § 103(a) over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM), U.S. Patent Application Publication No. 2004/0216030 (Hellman) and an Article by Peter Buneman Entitled, "UnQL: A Query Language and Algebra For Semistructured Data Based On Structural Recursion," (Buneman)?

The method of claim 5 depends from claim 1 and recites that for each source node in the source schema, selecting a plurality of candidate nodes in the target schema that are possible

matches. Claim 5 further recites for each source node in the source schema, generating a plurality of node transformation sequences for transforming to each of the plurality of candidate nodes; and for each source node in the source schema, selecting one of the plurality of node transformation sequences, a selected node transformation sequence, for the sequence of transformation operations that is associated with a least cost of data loss.

Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Schema Matching, XEM, Hellman and an article by Peter Buneman entitled, "UnQL: A Query Language and Algebra For Semistructured Data Based On Structural Recursion," (hereinafter called "Buneman").

Claim 5 is patentable for at least the reason that this claim depends from an allowable for the reasons that are set forth above. Claim 5 overcomes the § 103 rejection for at least the additional, independent reasons that are set forth below.

In the § 103 rejection of claim 5, the Final Office Action appears to rely on Schema Matching and Buneman. Final Office Action, pp. 19 and 20. However, neither reference discloses selecting a plurality of candidate nodes for each node in a source schema, which are possible matches and for each source node in a source schema, selecting one of the plurality of node transformation sequences, a selected node transformation sequence for the sequence of transformation operations that is associated with a least cost of data loss. In this regard, there is no discussion in these references of a transformation sequence with a data loss cost least cost of data loss, and there is no discussion in these references regarding selecting sequence that is associated with the least cost of data loss. Furthermore, the Final Office Action fails to set forth a plausible reason to explain why one of skill in the art in possession of the cited references would have derived the limitations that are presented in claim 5 and are missing from the references.

Thus, in view of the foregoing, the § 103 rejection of claim 5 is in error and should be reversed.

2. **Whether Claim 6 Is Rendered Obvious under 35 U.S.C. § 103(a) over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM), U.S. Patent Application Publication No. 2004/0216030 (Hellman) and an Article by Peter Buneman Entitled, "UnQL: A Query Language and Algebra For Semistructured Data Based On Structural Recursion," (Buneman)?**

Claim 6 depends from claim 5 and further recites in a match between a source node and a target node, selecting the selected node transformation sequence to achieve a match. Claim 6 recites that a first cost of data loss for the match is less than a second cost of data loss when deleting information contained in the source node, in a first iteration of matching.

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Schema Matching, XEM, Hellman and Buneman.

Claim 6 overcomes the § 103 rejection for at least the same reasons as the claims from which claim 6 depends, as discussed above. Claim 6 is patentable for the additional, independent reasons that are set forth below.

In the § 103 rejection of claim 6, the Examiner appears to rely on Buneman for the limitations of claim 6. However, Buneman fails to disclose selecting a selected node transformation sequence to achieve a match, where a first cost of data loss for the match is less than a second cost of data loss when deleting information contained in the source node, in a first iteration of matching. Not only do the references fails to disclose the limitations that are set forth in claim 6, the Final Office Action fails to set forth a plausible reason why one of skill in the art in possession of the references would have derived these limitations.

Thus, in view of the foregoing, the § 103 rejection of claim 6 is in error and should be reversed.

3. **Whether Claim 8 Is Rendered Obvious under 35 U.S.C. § 103(a) over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM), U.S. Patent Application Publication No. 2004/0216030 (Hellman) and an Article by Peter Buneman Entitled, "UnQL: A Query Language and Algebra For Semistructured Data Based On Structural Recursion," (Buneman)?**

Claim 8 depends from claim 5 and further recites in a match between a source node and a target node, selecting the selected node transformation sequence when an associated cost of data loss is less than a second cost of data loss when deleting source information contained in the source node and adding target information in the target node, in a second iteration of matching.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Schema Matching in view of XEM, Hellman and Buneman. In particular, the Final Office Action appears to rely on Buneman for the limitations that are introduced in claim 8. Final Office Action, pp. 19 and 20. However, neither Buneman nor the other references disclose selecting a node sequence when an associated cost of data loss is less than a second cost of data loss when deleting source information contained in a source node and adding target information in a target node, in a second iteration of matching. Furthermore, the Final Office Action fails to set forth a plausible reason to explain why one of skill in the art in possession of these references would have derived the additional limitations that are set forth in claim 8.

Thus, in view of the foregoing, the § 103 rejection of claim 8 is in error and should be reversed.

D. Whether Claims 22 and 25 Are Rendered Obvious under 35 U.S.C. § 103(a) over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM), U.S. Patent Application Publication No. 2004/0216030 (Hellman), U.S. Patent No. 6,874,141 (Swamy) and the Article by Peter Buneman Entitled, "UnQL: A Query Language and Algebra For Semistructured Data Based On Structural Recursion," (Buneman)?

1. Whether Claim 22 Is Rendered Obvious under 35 U.S.C. § 103(a) over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM), U.S. Patent Application Publication No. 2004/0216030 (Hellman), U.S. Patent No. 6,874,141 (Swamy) and the Article by Peter Buneman Entitled, "UnQL: A Query Language and Algebra For Semistructured Data Based On Structural Recursion," (Buneman)?

Claim 22 depends from claim 18 and further recites for each source node in the source schema, selecting a plurality of candidate nodes in the target schema that are possible matches; for each source node in the source schema, generating a plurality of node transformation sequences for transforming to each of the plurality of candidate nodes; and for each source node in the source schema, selecting one of the plurality of node transformation sequences, a selected node transformation sequence, for the sequence of transformation operations that is associated with a least cost of data loss.

Claim 22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Schema Matching in view of XEM, Hellman, Swamy and Buneman.

Claim 22 overcomes the § 103 rejections for at least the same reasons as claim 18, as discussed above. Claim 22 overcomes the § 103 rejections for at least the additional, independent reasons that are set forth below. The Final Office Action in particular refers to pages 2 and 7 of Schema Matching for the purported disclosure of the elements of claim 22. Final Office Action, p. 11. However, the cited language fails to disclose selecting a plurality of candidate nodes in a target tree or the generation of a plurality of node transformation operations transforming to each of the plurality of candidate nodes. Furthermore, claim 22 recites selecting one of the plurality of node transformations from a selected node transformation operation having the least cost data loss. The Final Office Action refers to Schema Matching's discussion

of a "distance" and attributes this "distance" as a "cost." Final Office Action, p. 11. Even assuming, however, for purposes of argument, that a distance is a cost, Schema Matching fails to disclose that the distance is the least cost data loss or that the cost is even a data loss.

Therefore, for at least any of the foregoing reasons, Schema Matching fails to disclose the additional limitations that are set forth in dependent claim 22. Furthermore, the Final Office Action fails to set forth a plausible reason to explain why one of skill in the art in possession of the cited references would have derived the missing claim limitations.

Thus, in view of the foregoing, the § 103 rejection of claim 22 is in error and should be reversed.

2. **Whether Claim 25 Is Rendered Obvious under 35 U.S.C. § 103(a) over the Hong Su Article Entitled, "Identification of Syntactically Similar DTD Elements for Schema Matching," (Schema Matching) in View of the Hong Su Article Entitled, "XEM: Managing the Evolution of XML Documents," (XEM), U.S. Patent Application Publication No. 2004/0216030 (Hellman), U.S. Patent No. 6,874,141 (Swamy) and the Article by Peter Buneman Entitled, "UnQL: A Query Language and Algebra For Semistructured Data Based On Structural Recursion," (Buneman)?**

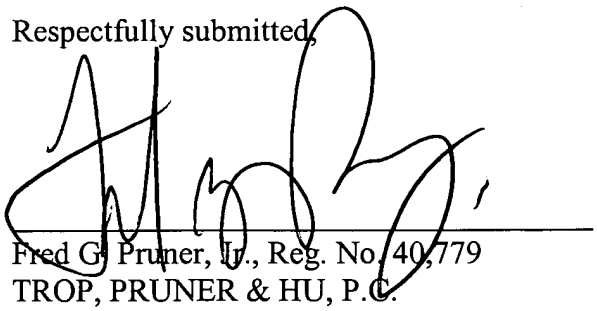
Claim 25 depends from claim 22 and further recites in a match between a source node and a target node, selecting the selected node transformation sequence when an associated cost of data loss is less than a second cost of data loss when deleting source information contained in the source node and adding target information in the target node, in a second iteration of matching.

Claim 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Schema Matching in view of XEM, Hellman, Swamy and Buneman. In particular, the Final Office Action appears to rely on Buneman for the limitations that are introduced in claim 25. Final Office Action, pp. 19 and 20. However, neither Buneman nor the other references disclose selecting a node sequence when an associated cost of data loss is less than a second cost of data loss when deleting source information contained in a source node and adding target information in a target node, in a second iteration of matching. Furthermore, the Final Office Action fails to set forth a plausible reason to explain why one of skill in the art in possession of these references would have derived the additional limitations that are set forth in claim 25.

Thus, in view of the foregoing, the § 103 rejection of claim 25 is in error and should be reversed.

Applicant respectfully requests that each of the final rejections be reversed and that the claims subject to this Appeal be allowed to issue.

Respectfully submitted,



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CLAIMS APPENDIX

The claims on appeal are:

1. A method of document transformation comprising:

a) modeling a source XML document corresponding to a source schema as a source tree having a plurality of source nodes;

b) modeling a target XML document corresponding to a target schema as a target tree having a plurality of target nodes; and

c) generating a sequence of transformation operations that transforms said source tree to said target tree, said sequence of transformation operations utilizing an extensible stylesheet language for transformations (XSLT) generator to translate the sequence of transformation operations into an equivalent XSLT transformation script and utilize the transformation script to transform an input XML document corresponding to the source schema to the target XML document corresponding to the target schema.

3. The method of document transformation as described in Claim 1, wherein c) comprises:

matching said plurality of source nodes to said plurality of target nodes.

4. The method of document transformation as described in Claim 1, wherein c) comprises:

automatically generating said sequence of transformation operations.

5. The method of document transformation as described in Claim 1, further comprising:

d) for each source node in said source schema, selecting a plurality of candidate nodes in said target schema that are possible matches;

e) for each source node in said source schema, generating a plurality of node transformation sequences for transforming to each of said plurality of candidate nodes; and

f) for each source node in said source schema, selecting one of said plurality of node transformation sequences, a selected node transformation sequence, for said sequence of transformation operations that is associated with a least cost of data loss.

6. The method of document transformation as described in Claim 5, wherein f) further comprises:

in a match between a source node and a target node, selecting said selected node transformation sequence to achieve a match, where a first cost of data loss for said match is less than a second cost of data loss when deleting information contained in said source node, in a first iteration of matching.

7. A method of document transformation as described in Claim 6, further comprising:

matching said source node to said target node having a synonymous label to achieve said match.

8. The method of document transformation as described in Claim 5, wherein f) further comprises:

in a match between a source node and a target node, selecting said selected node transformation sequence when an associated cost of data loss is less than a second cost of data loss when deleting source information contained in said source node and adding target information in said target node, in a second iteration of matching.

9. The method of document transformation as described in Claim 5, wherein f) further comprises:

selecting said selected node transformation sequence having the least associated cost of data loss.

10. A method of document transformation comprising:

a) modeling a source schema of XML and a target schema of XML as a tree structure creating a source tree and a target tree, said source tree having a plurality of source nodes, said target tree having a plurality of target nodes; and

b) generating a sequence of transformation operations that transforms said source XML document to said target XML document, wherein said plurality of source nodes of said source schema are matched and transformed to said plurality of target nodes in said target schema, said sequence of transformation operations utilizing an extensible stylesheet language for transformations (XSLT) generator to translate the sequence of transformation operations into an equivalent XSLT transformation script and utilize the transformation script to transform an input XML document corresponding to the source schema to the target XML document corresponding to the target schema.

11. The method of document transformation as described in Claim 10, wherein b) comprises:

b1) for each source node in said source tree, selecting a plurality of candidate nodes in said target tree that are possible matches;

b2) for each source node in said source tree, generating a plurality of node transformation operations transforming to each of said plurality of candidate nodes; and

b3) for each source node in said source tree, selecting one of said plurality of node transformation operations forming a selected node transformation operation having the least cost of data loss.

12. The method of document transformation as described in Claim 11, further comprising:

combining said selected node transformation operation for each of said source nodes matched to a target node into a sequence of transformation operations that transforms said source schema to said target schema.

13. The method of document transformation as described in Claim 10, wherein said source schema is a source document type definition (DTD) and said target schema is a target DTD.

14. The method of document transformation as described in Claim 10, further comprising:

folding nodes in said source and target trees in a preprocessing phase to find one-to-one node matching.

15. The method of document transformation as described in Claim 10, further comprising:

merging nodes in said source and target trees in a preprocessing phase to find one-to-one node matching.

16. The method of document transformation as described in Claim 10, further comprising:

performing transformation operations only once at a node in said source tree and said target tree with the following exceptions:

a) a relabel operation following an unfold operation;

b) said unfold operation following said relabel operation;

c) said relabel operation performed between an attribute and an element following or followed by a deletion or an addition of a qmark quantifier node.

18. A computer system comprising:

a processor; and

a computer readable memory coupled to said processor and containing program instructions that, when executed, implement a method of document transformation comprising:

a) modeling a source XML document corresponding to a source schema as a source tree having a plurality of source nodes;

b) modeling a target XML document corresponding to a target schema as a target tree having a plurality of target nodes; and

c) generating a sequence of transformation operations that transforms said source tree to said target tree, said sequence of transformation operations utilizing an extensible stylesheet language for transformations (XSLT) generator to translate the sequence of transformation operations into an equivalent XSLT transformation script and utilize the transformation script to transform an input XML document corresponding to the source schema to the target XML document corresponding to the target schema.

20. The computer system as described in Claim 18, wherein c) in said method comprises:

matching said plurality of source nodes to said plurality of target nodes.

21. The computer system as described in Claim 18, wherein c) in said method comprises:

automatically generating said sequence of transformation operations.

22. The computer system as described in Claim 18, wherein said method further comprises:

d) for each source node in said source schema, selecting a plurality of candidate nodes in said target schema that are possible matches;

e) for each source node in said source schema, generating a plurality of node transformation sequences for transforming to each of said plurality of candidate nodes; and

f) for each source node in said source schema, selecting one of said plurality of node transformation sequences, a selected node transformation sequence, for said sequence of transformation operations that is associated with a least cost of data loss.

23. The computer system as described in Claim 22, wherein f) in said method further comprises:

in a match between a source node and a target node, selecting said selected node transformation sequence to achieve a match, where an associated cost of data loss for said match is less than a second cost of data loss when deleting information contained in said source node, in a first iteration of matching.

24. A computer system as described in Claim 23, wherein said method further comprises:

matching said source node to said target node having a synonymous label to achieve said high quality match.

25. The computer system as described in Claim 22, wherein f) in said method further comprises:

in a match between a source node and a target node, selecting said selected node transformation sequence when an associated cost of data loss is less than a second cost of data loss when deleting source information contained in said source node and adding target information in said target node, in a second iteration of matching.

26. The computer system as described in Claim 22, wherein f) in said method further comprises:

selecting said selected node transformation sequence having the least associated cost of data loss.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.